Notebook, N-08-01-20

This notebook covers the period April-May 1907. All entries are by Edison. The book contains logs of storage battery cell tests and notes regarding the preparation and loading of nickel flake in the cell grids. It appears to have been used primarily at Fort Myers, Florida. At the beginning of the book, Edison's youngest son, Theodore, signed his name in November 1906. The pages are unnumbered. Approximately 80 pages have been used.

Theodo
Edison
1906
NOVEMBER
81.

William H. Hasse
... STATIONER.
Good Work Pro
68 WILLIAM STREE
NEW YORK.

Account for fact that with 2000 flake Went off 6 a on

3000 " " "

4000

5000

6000

7000

8000

Hot Runs	Max flake
50	92+8
100	89+11
150	85+15
200	81+19
250	78+22
300	75+25
350 -	73+27

Account for Reversal of 350 tubes on 450 Run which Capacity was greatly increased ~~that~~ this Capacity was held for 200 or more hot runs to wit 359 360 361 to 373

Account for fact that Co Cobalt plated tubes were very much lower capacity after many hot runs than Nickel plated tubes —

Holland Efficiency

from Off pump

6 hours	7 hours	10 hours		amp Chg 6 hrs	amp 7 Hrs	amp 10 Hrs
740	856	929				
810	857	922				
805	852	937	929	66	61	46.5
845	894	967				
850	902	955				
842	886	947	956	70	64	47.8
780	945	922				
800	843	915				
775	837	908	915	65.5	60	45.7
774	840	957				
813	878	975				
825	866	995	976	67	61.5	48.8
820	878	921				
823	882	877				
823	870	910	904	68.5	62.5	45.5
800	830	750	004			
856	907	950				
827	868	900	925	70	63	46
816	860	893				
875	870	920				
823	863	905	906	68.5	62	45.5
857	910	952				
848	899	947				
847	892	947	949	70.5	64.5	47.5

Holland Efficiency Tests Tubes

Wellington

Ducky 150 – Chg 200

		3 hours Chg Time	4 hours	5 hours	Stop watch	Efficiency
21 # .005 J 1/2 4 Rings	5398	515	620	723	53.1	
	5399	517	640	735	54.6	
4.32	5400	517	632	723	52.5	53.4
21 Hole .005 Spiral –	5401	537	663	768	57.3	
	5402	537	666	768	57.4	
4.42	5403	535	663	763	57.1	57.3
26x30 .005	5404	522	635	725	53.9	
	5405	527	638	728	53.8	
4.26	5406	522	625	724	53.6	53.8
26x30 Spiral	5407	492	600	697	51.1	
	5408	510	625	725	53.1	
4.49	5409	510	635	740	54.1	52.7
Punched Hole	5410	535	657	750	55.6	
	5411	535	657	749	56.3	
4.42	5412	537	668	761	57.1	56.3
Punched Spiral	5413	515	325?	725	—	
	5414	520	677	777	57.1	
4.51	5415	542	671	766	57.6	57.3
2400. .005	5416	535	647	747	56	
	5417	537	660	758	56.8	
4.28	5418	537	655	747	56.1	56.3
2400 .005 Spiral	5419	537	673	778	58.6	
	5420	540	670	772	57.9	
4.48	5421	542	670	771	57.9	58.1

6hour	7Hour	10hour		Effy 6	Effy 7	Effy 10
787	861	997				
798	867	998				
772	842	980	991	65.5	61	49.5
772	827	925				
787	845	931				
791	850	940	932	65	60	46.5
795	873	1032				
806	882	1040				
770	843	995	1022	66	62	51
871	942	1080				
858	925	1076				
857	922	1058	1071	72	66.5	53.5
735	806	922				
765	836	966	944	62.5	58.5	47
700	760	840	840	58	54	42
818	878	970				
822	881	952				
832	887	950	937	68.5	63	47.8
805	837	935				
847	867	923				
825	857	946				
762	792	925				
672	810	972				
827	861	967				

2nd Lot (Cuba Holland Economy Coal) 200 cfm 150 deg

	2 Hour	3 hour	4 hour	5 hour	Water
No wash not fit low heat. 26x30 Spiral	5586	377	505	607	712	52.9
	5587	376	513	618	721	53.4
5.26	5588	367	510	602	700	52
21 Hole .005 Spiral No wash not fit low heat.	5589	372	513	616	707	53.1
	5590	377	527	631	718	54.1
5.17	5591	377	525	630	730	55.1
1/2 wash not fit low heat 26x30 .005 Spiral	5598	375	508	610	717	53
	5599	375	511	615	722	53.4
5.37	5600	368	500	602	702	51.7
21 Hole .005 Spiral 1/2 wash not fit low heat	5601	385	548	667	775	57.8
	5602	385	537	657	765	56.6
5.43	5603	385	537	660	765	56.6
1/2 wash not fit High heat Spiral 26x30	5604	352	492	587	687	51
	5605	370	495	597	696	50.9
21 Hole same as 5604 5.09	5606	349	492	567	665	49.8
Reg wash filtered dried Low heat, 26x30 Spiral	5609	387	525	637	738	53.8
	5610	387	540	647	746	54.2
4.77	5611	387	540	653	753	55.1
21 Hole Reg wash filtered dried low heat Spiral	5612	372	500	641	723	52.4
	5613	386	523	677	757	55.2
4.66	5614	381	515	658	743	52.7
Reg no wash not filtered dried high heat 26x30	5615	371	478	615	692	49.6
	5616	375	496	462	542	38.1
4.60	5617	377	505	652	740	53.1

6	7	10 hours
792	820	897
786	817	893
756	790	860
800	822	887
812	845	895
802	820	863
645	711	807
677	717	797
692	725	837

		2 Hour	3	4			
Reg no wash not followed dried high heat 26X30. spiral - 4.61	5618	372	501	635	717	51.4
	5619	377	497	642	712	50.5
	5620	370	491	617	698	49.2
Reg number wash not followed dried low heat. 26X30 - spiral	5621	380	508	646	723	51.4
	5622	378	516	662	742	53.1
	5623	382	518	663	746	53.1
No wash not followed Dried high heat, 21 Hole 005 Spiral	5624	345	440	547	617	42.6
	5625	345	437	548	620	44.4
	5626	345	446	553	625	44.8

1/2 wash not followed dried low heat no heat green on about loads.

21 Hole 005 Spiral heat tubs,

Told Holland Change a cold 6 or 7 hours hot at 135 then put Mi tube in Cold 21 with fresh chip 75 + put 75 in Cold Kot with fresh chip Mi + see which loads Capacity by heat -

Spec gravity

	NaOH	KOH
10%	1·012	1·083
15%	1·170	1·128
20%	1·225	1·177
25%	1·279	1·230
30%	1·332	1·288

NaOH less volatile than KOH.
Electric positive Rb. Cs K Na Li

KOH from Alcohol always contains KCl + K_2CO_3
also K acetate from action of KOH on the alcohol

Na metal not attacked by Bromine
K takes fire therein
Na Can be fused with Iodine
K Explodes when thus fused
Na immersed in Aniline even boiling not attacked
K acts violently on Aniline
Bismuth Potassium Thiosulphate a precipitate
Na forms no read salt or precip
K forms K_2O K_2O_2 K_2O_4
Na " Na_2O Na_2O_2

Hot conc sol KOH deposits on cooling a hydrate $KOH, 2H_2O$
Na Spec g 1.385 Cooled to freezing point deposits a hydrate $2NaOH, 7H_2O$ –

KOH salts precipd by Perchloric acid Tartaric acid, Platinum Chloride, & form crystals of alum with Aluminum Sulphate
NaOH salts forms no precip or gives an alum with above reagents –

Acid Metaantimonate K gives white precip of Metaantimonate Sodium even diluted 1/1000 –

LiOH absorbs CO_2 from air more slowly than NaOH
$LiOH + H_2O$ is the Hydrate,
Li_2CO_3 only slightly soluble in water.
100 H_2O dis 0.769 pts. at 13. 7.78 at 100°

K_2CO_3 is deliquescent
Na_2CO_3 is not deliquescent.

Soda Soaps are invariably harder than K Soaps with the same materials –
K soaps are more soluble – H2O than Na Soaps

All distilled water contains ammonia.
To detect add very small quantity Cupric Sulphate to distilled water - when this is diluted with more distilled water a greenish tinge is given depositing a basic Cupric Sulfate,

gid set tubes

2 Hours 200

5612	372
5613	386
5614	381
5615	371
5616	375
5617	379
5618	372
5619	377
5620	370
5621	380
5622	378
5623	382
5624	375
5625	373
5626	349

Equiv on New 4 pole Cell 120 Cycles

24 amp hours at (HR)	32 Rate	40 Rate	48 Rate
	Cap amp		
124	113.7	107.5	100.1
123.6	115.2	111.3	105.4
125.6	114.2	107	99.5
133.1	122.8	117.9	116.
118.2	109.2	102	96.3
131.8	119.3	108	109.4

Boxes

Charge all cases 1000 mile hours points just amp 7/04 not by Capacity

	Chg 6 3/4 at 1.60	Chg 5 hour 2.10	Chg 4 hour 2.50	Chg 3 1/2 at 3.00	* Not when chg
5586	78.2	71.2	67.0	61.8	
5587	78.7	72.1	68.5	64.0	
5588	77.0	70.0	66.2	62.0	
5589	76.5	70.7	68.7	66.0	
5590	77.0	71.8	69.5	65.7	
5591	78.5	73.5	70.7	64.8	
5598	79.0	71.7	66.6	62.2	
5599	79.5	72.2	68.0	63.7	
5600	77.0	70.2	66.0	60.7	
5601	84.0	77.5	75.0	70.0	
5602	83.1	71.5	73.0	77.7	
5603	82.5	76.5	50.0	61.7*	
5604	74.8	68.7	65.0	61.7	
5605	76.8	69.6	65.7	62.0	
5606½	70.2	66.5	60.7	57.0	
5609	81.7	73.8	60.5	66.7	
5610	82.2	74.6	69.6	68.7	
5611	83.1	75.3	72.3	69.7	

Cell 5603 developed low voltage curve which cut by the 1 Volt line on the horizontal part therefore an small variation in charge voltage from temp changes or other causes makes a great difference in amp hrs equal to 1 Volt, Those last two runs which are high made on very warm days –

Low V of 5603 not caused by bad contact because chg voltage was also low the run is OK seems to be to be a bad defect in tube check

it appeared in 5413 Lot 1 & 5616 & 5624

Chgd 1000 ml amp

	6½ hrs 1500	5 hrs 2000	4½ hrs 2500	3½ hrs 3000		
5612	78.3	72.3	69.7	64.8		
5613	80.2	75.7	73.7	71.7		
5614	79.5	74.3	71.6	67.6		
5615	76.8	69.2	66.1	61.2		
5616	55.0	54.2	65.5	70.7	?	
5617	79.5	74.0	70.7	67.0		
5618	77.5	71.7	69.6	65.7		
5619	77.7	71.2	69.5	64.7		
5620	74.8	69.8	66.3	62.8		
5621	78.2	72.3	70.1	65.3		
5622	79.2	74.2	71.8	68.0		
5623	78.5	73.2	71.7	68.5		
5624	55.0	61.7	58.2	54.8		
5625	66.5	62	58.7	54.7		
5626	68.2	62.5	59.5	55.2		

Note: Three tubes often a long
Change in concentration gives very than
15% - give an accounting of length
Yellows gap as high as 465
for 400 put in —
465 being for 27% 27. 21 & 15
bring the 3 points 27% 460 - interpolated
Start 402 then 21 gives, 425 -
interpolation 404 @ 18% then
15% 350@360 - going on 4th day to 398

Chg 200.50 dur 150

4th Leaf Tubes various % NaOH

4th run

	2 Hours	3	4	5	6	7	10
21 Hours 1½ spent 2½ not to be 24 to ½ washed full dur hour	5876	382	495	610	720	793	830	943
27% NaOH	5877	392	505	625	742	813	867	970
	5878	365	475	587	700	765	823	932
25% NaOH	5879	400	525	646	767	837	900	970
	5880	400	522	632	756	832	882	995
	5881	393	516	628	756	832	882	997
23% NaOH	5882	400	543	658	782	847	920	1025
	5883	393	515	623	743	817	867	967
	5884	395	518	622	740	815	867	972
21% NaOH	5885	390	518	630	745	825	875	995
	5886	396	536	652	775	860	920	1025
	5887	400	536	647	765	843	900	1012
19% NaOH	5888	396	542	661	783	870	932	1050
	5889	398	535	650	771	863	922	1050
	5890	391	538	661	775	862	923	1067
17% NaOH	5891	373	520	623	722	812	875	1030
	5892	397	557	680	801	890	950	1100
	5893	397	546	666	773	865	925	1070
15% NaOH	5894	398	527	642	751	841	907	1068
	5895	397	557	690	807	907	962	1100
	5896	385	532	645	751	840	902	1067
13% NaOH	5897	398	541	662	770	865	927	1073
	5898	398	533	662	763	857	917	1075
	5899	398	540	657	751	850	910	1070

With the new filler on little machine, single tamp we have been making allow tubes with up to May 1907 – We put in a revolving shaft with 2 arms in bottom of flake hopper –
Made 2 tubes with cup set for 10 flake 24 green

Weight No 1 mix 7283 – 10 to 24
2 " 7356 –

Removed mix & dissolved out green by KCy – Weight flake
No 1 1.954
No 2 2.063 –

Put back green 10 to 24 The weights showed 6%
No 1 2.184 – 230 mg/shy 10%
No 2 2.206 – 143 " 6.5%

Altered Cup to feed 10 flake 31 green
Weight No 3 mix 7114
No 4 " 7046

Dissolved out green by KCy – Weight flake
No 3 1.699
4 1.677

Showed have got No 3 17.78 – 75 mg 5%/shy
4 1761 84 " 5%/shy

LiOH 2 grams to 175 cc 21% good — on hot test

Same as above with 5 to 8 grams K_2CO_3 added is better —

Green soaked in Sol of Bi hydrox in NH_4Cl then dried + boiled in KOH 5% then washed free KOH is good also with LiOH + better than Reg 21% K without LiOH ie stimulates up —

But 15% NaOH 3 Na_2CO_3 2 Li0 is bad

Nitrates are very bad —

Also Silicate K to extent of 5 grams is bad + compares with Borate + Aluminate —

1st 50 H of new Companion Set KOH + NaOH

% KOH	+ NaOH KOH. 50 R	NaOH. 50 R	Dif	% NaOH Ions
33	718	324	—	42.9
31	646	718	+72	40.3
29	820	855	.35	37.7
27	844	998	154	35.1
25	905	991	86	32.5
23	899	1005	106	29.9
21	904	993	89	27.3
19	933	905	= 28	24.7
17	931	907	= 24	22.1
15	915	907	= 8	19.5
13	881	903	+ 22	16.9
11	855	914	59	14.3
9	813	877	64	11.7
7	—	830		

Gut

Lithia

21% KOH. in which Lithium hydroxide is dissolved to saturation contains in 100 cc 2.8886 miligrms LiOH.

In 15% NaOH. saturated with LiOH. contains 3.2936 milgms —

A 3 inch reg tube filled in Single Tamp machine, which we have used to make all the test cells up to date, April 30th 1907. gave on a test thus

1/2 wash not filtered dried low heat, Reg 0001
Ni flake 21 hole 005 3½ wt 4 rings
10 flake 24 green thru 20 mesh.

Total weight 8.868
Wt tube & caps 2.081
6 787

Weight of flake found by dissolving green out by KCy
1.192 milg — Wt should have been 2.034.
1020 of 842 milg — this is 6 flake 24 green

Long Tube Total wt 13254
Wt Tube & bottom 2451
10 803

Wt flake found 3.375
on basis of 10 of 24 green should have been a shade less to 10.3 flake to 24 or nearly perfect.

Phenomenon #

Sodium Oleate little Sol in 21% KOH.
" almost Insol in 21% KOH Sat with LiOH

K Oleate Sol in 21% KOH.
Very little dis in 21% KOH saturated LiOH.

Na Oleate Sol KOH. 21%
also Sol with 21% Sat LiOH.

K Oleate Sol 21% KOH.
also 21% Sat LiOH.
but not so easy as KOH only

Entered –

		No	Cap Zero Inches	Time	Volts	amp	Watt
80 Fe 15 Cu 5 Zn (non pyro) 5% H_2O		3013	1210	5	73	80.6	58.8
		3014	1255		73.9	83.6	61.7
80 Fe 15 Cu 5 Zn Self H. 5% H_2O		3015	1170	"	73.4	78	57.2
		3016	1147		73.5	76.5	56.2
60 Fe 40 Cd Non Pyro – 5% H_2O		3023	1340	"	74	89.3	66.1
		3024	—		Powder spl.		
60 Fe 40 Cd No H_2O non pyro		3025	1335	"	75.1	89	66.8
		3026	1297		75.5	86.5	65.3
80 Fe 20 Cu 5 Sn 5% H_2O Self H.		3027	1035	"	75.1	69	51.8
		3028	1042		74.5	69.5	51.7
90 Fe 10 Wo 5% H_2O Non Pyro		3219	1165	"	73.2	77.6	56.8
		3220	1150		73.1	76.6	56
90 Fe 10 Wo Self H.		3221	1150	"	73.7	76.6	56.4
		3222	1090		72.6	72.6	52.7
80 Fe 15 Cu 5 Sb 5% H_2O Self H.		3235	1275	"	75.3	85	64
		3236	1285		75.3	85.6	64.5
80 Fe 15 Cu 5 Sb – non pyro 5% H_2O		3249	1250	"	74.5	83.5	62.2
		3250	1295		74.9	86.3	64.6
85 Fe 15 Wo bronze (yellow)		3269	1092	"	74.1	72.8	53.9
		3270	1150		74.6	76.6	57.1
90 Fe 10 WO non pyro 5% H_2O Dry		3275	1215		75.1	81	60.5
		3276	1125		75.2	81.6	61.3
—		3279	1140		76.2	76	57.9
		3280	1190		76.4	79.3	606
Fe 85 WO 15 (Black) Non pyro – 5% H_2O		3281	1100	6 gr	75	73.3	54.9
		3282	1092		75.1	72.8	54.6

Ent

	No	Capacity 5 hr rate	amp	Voltage	Amp	Watt	in 1½ inch, Amp	Watt
72 oz Cu 15 Cd 5% non pyro 5% H2O	3283	1087	5.5	75	72.5	54.3		
	3284	1087		76.7	72.5	55.6		
70 oz 30% WO Yellow Prompt non pyro 5% H2O	3289	1017	5	74.3	67.8	50.3		
	3290	1097		74.9	73.1	54.7		
80 oz 15 Cu & Cd ecch Heat 5% H2O	3291	1022	5.5	76.7	68.1	52.2		
	3292	1040		76.8	69.3	53.2		
80 oz 20 Sb Prime non pyro 5% H2O	3295	1180	5	73.3	79.6	58.3		
	3296	1175		72.9	78.3	57.1		
80 oz 20 Wo Yellow Prompt non pyro 5% H2O	3299	1115	5	73.7	74.3	54.7		
	3300	1062		74	70.8	52.3		
75 oz 25 Wo Blue Prompt non pyro non pyro 5% H2O	3313	1115	5	74.7	74.3	55.5		
	3314	1045		74.5	69.6	51.8		
75 oz 25 Wo Yellow Prompt non pyro 5% H2O	3315	1092	5	73.6	72.8	53.6		
	3316	1090		74.3	72.6	53.9		
D.T.G. 135 Self heating 80 oz WO 20 Ex H2O (yellow Prompt)	3319	1080	5	74.3	72	53.5		
	3320	1147		74.5	76.5	57		
D.T.G. 138 Self H. 75 oz 25 WO blue oxide Ex H2O	3333	1030	5	74.2	68.6	50.8		
	3334	1100		75	73.3	54.9		
D.T.G. 99 72 oz WO 10 5% H2O	3335	1295	5	76.2	86.5	65.9	88.3	
	3336	1310		76.6	87.3	66.8	88.8	
D.T.G. 153 non pyro 72 oz WO 10 Red Prompt 5% H2O	3337	1160	6	75.1	77.3	58.1		
	3338	1150		73.9	76.6	56.6		
D.T.G. 187 non pyro 85 oz 15 Sb 5% H2O	3341	1195	5	74.4	79.6	59.1		
	3342	1170		74.4	78	58.1		

5 hour chg 300 ma

		Tri		Volt	amp	watt	16/watt amp	watt
G-139. sulph. 80 Hg 20 Wo blue oxide 5 Hgo —	3343	1167	5	75.9	77.8	59		
	3344	1160		75.6	77.3	58.4		
G-148 Nun pyro 72 95 Wo 5 blue ox 5 Hgo —	3349	1085	5	73.4	72.3	53		
	3350	1040		73	69.3	50.6		
G-89 Nun pyro 95 Hg 5 Sb 5 Hgo —	3351	1112	6	75.6	74.1	56	81.6	
	3352	1125		75.8	75	56.9	82	
	3359	1097			73.1		80.6	
	3360	1110			74		82.1	
	3369	975			65		81	
	3370	1172		74.2	78.1	57.9	84.6	
	3375	1025			68.3			
	3376	1030			68.6			
	3377	1160		74.1	77.3	57.3	86	
	3378	1125		74.8	75	56.1	85	
	3387	1035			69			
	3388	1050			70			
	3389	1160		72.7	77.3	56.1	85.3	
	3390	1157		73.1	77.1	56.3	85	
	3397	1200		73.9	80	59.1	89	
	3398	1240		73.3	82.6	60.5	89	
	3406	1125		75.2	75	56.4	84.3	pasted, split
	3407	995			66.3			
	3414	1035			69			
	3417	1175		74.6	78.3	58.4		
	3418	1012						

See further along

		rpm		S/G Volt	S/G amp	S/G Watt	10% Resist 2mg
3419	1085				72.3		
3420	915				61		
3421	1010				67.3		85.5
3422	1080				72		87.3
3425	1040				69.3		
3426	990	9r	Hesy		66.		
3500	1175	5			78		
3504	1175	5			78		
3505	1000	5			66		
3506	990	5			66		
3491	1049	4	4	74.4	87.2	64.9	
3492	1012	4	4	74.8	84.4	63.1	
3497	1042	4	4	76.3	86.8	66.2	
3498	1074	4	4	74.3	85.8	63.7	
3509	850	4	4	70.8			
3510	880	4	4	66.7			
3511	885	4	4	73.8			
3512	875	4	4	72.9			
3591	887	3.5	3.5	75.6	84.5	63.9	
3592	892	3.5	3.5	75.2	85	63.9	
3593	795	4	4	75.2	75.7		
3594	757	5	5		72.2		
3533	827	5	5		68.9		
3534	730	5	5		60.8		
3545	1000	5	5		64		
3546	1037	5	5		66.2		

Viscosity at 25 Cent of KOH + NaOH.

Water = 32.6 average time

% NaOH	1st Time in Seconds	2nd Time	Average Time in Seconds	Viscosity	Sp. g
15	36.2	36	36.1	1.1074	1.166
17	37.2	37.2	37.2	1.1411	1.188
19	38.4	38.4	38.4	1.1781	1.209
21	39.6	39.8	39.7	1.2178	1.232
23	40.6	40.8	40.7	1.2484	1.254
25	42.8	42.4	42.6	1.3067	1.275
27	45	45	45	1.3804	1.290
33	61.2	61.2	61.2	1.8466	1.359
% KOH					
9	32.6	32.4	32.5	0.9966	1.070
11	32.4	32.6	32.5	0.9966	1.088
13	32.6	32.8	32.7	1.0030	1.107
15	33	32.6	32.8	1.0061	1.124
17	33	33.2	33.1	1.0153	1.142
19	33.2	33.4	33.3	1.0215	1.162
21	33.8	33.6	33.7	1.0337	1.184
23	33.6	33.6	33.6	1.0307	1.204
25	34	34	34	1.0429	1.225
27	34.4	34.4	34.4	1.0552	1.247
33	35	35	35	1.0736	1.319

Ent

greater viscosity of Na at 15 than KOH 21
showing solute molecules
above NaOH is more hydrated
thus interfering
better conductor

Viscosity 21% KOH — 1.0391 but with
2.8586 LiOH, its viscosity is 1.126

15% NaOH, 1.119 - ~~[illegible]~~ saturated with
LiOH, 3.296 gms its viscosity is 1.292

Only

Experiments by Holland

Small cell Nickel strips (18) blank picks
½ inch apart 1000 milamp between
90 cc following % KOH - Thermom in
Each cell. Run Each % 2 hours -

KOH			NaOH		
15	rise	10.3 Fahr	15	Rise	8.6 Fahr
17	"	10.6	17	—	9.5
19		11.5	19	—	8.7
21	—	11.3	21	—	8.7
23	—	12.5	23	—	8.8
25		10.9	25	—	8.9
27		10.6	27	—	8

With same % KOH but with 2 gms LiOH in each

15	11.0 Fahr
17	9.7
19	11.2
21 —	10.9
23	10.9
25 —	11.9
27	10.1

NaOH being more hydrolized
according to new theory
should be better conductor.

Capacity to 1 Volt on 5 hour chg @ 300 of 1 grams in NaOH

		Ohms	Volts	Amps	Watts		
2930	16% NaOH	1380	74.6	92	68.6		
2931		1350	72.9	90	65.6		
3023		1345	73.6	89.6	65.9		
3028		1317	72.1	87.8	63.3		
3026		1316	74.5	87.3	65		
3143		1272	73.7	84.8	62.5		
3144		1290	74.7	86	64.2		
3145		1275	74.7	85	63.5		
3195	21% NaOH	1400	72.4	93.3	68.4		
3196		1440	74.8	96	71.8		
3235		1400	73.4	93.3	68.4		
3236		1387	73.3	92.5	67.8		
3213	13% NaOH	1357	71	90.5	64.3		
3214		1360	72.4	90.6	65.6		
3249		1190	72.9	79.3	57.7		
3250		1250	73	83.3	60.8		

End

Prono all changed a discharg 300 ml amp per gram

		9mo					
	3453	5	5 hour	887	59.1		
	3454	5	"	865	57.6		
	3457	5	"	900	60		
	3458	5	"	857	57.1		
	3463	4.5	4½ h	950	70.4		
	3464	4.5	"	922	68.3		
	3441	4	4 "	825	68.8		
	3442	4	4 "	827	68.9		
	3447	"	"	900	75		
	3448	"	"	875	74.6		
	3449	"	"	830	69.2		
	3450			832	69.4		
	3451	"	"	875	72.9		
	3452			852	71		
	3455	"	"	810	67.5		
	3456			835	69.6		
	3467	"	"	875	72.9		
	3468			852	71		
	3471	"	"	782	65.2		
	3472			785	65.4		
L.O. 8076 2024	3481	"	"	1007	83.8	75.8	63.5
	3482			995	82.9	75.9	62.9
	3459	3	3 hrs	889	74.1		
	3460	"	"	857	71.4		
	3469	"	"	807	67.5		
	3470	"	"	802	70.2		
Ch. Ferrous Ammon Sulfate	3475	"	"	1067	85.3	76.8	65.5
	3476			1070	88.6	77.6	64.7
	3547	5	5 hrs	1037	69.1		
	3548			1050	70		

Cut

after 25 Rise of Voltage nearly directly as Concentration diminishes —

Overcharge Tubes Lot 4 — NaOH —

NaOH		Run 6 IV	Run 6 To .5V	Run 7 IV	Run 7 To .5V	Run 8 IV	avg Volts
27%	5876	987	1192	850	1197	1000	1.10 Volt
	5877	1062	1235	963	1235	1087	
	5878	1050	1230	920	1230	1067	
		1033	1219	911	1231	1051	
25%	5879	1087	1266	1065	1287	1162	1.137
	5880	1100	1307	1068	1292	1171	
	5881	1125	1327	1075	1290	1191	
		1104	1298	1069	1289	1181	
23%	5882	1086	1327	1090	1320	1170	1.157
	5883	1000	1262	976	1257	1087	
	5884	1023	1292	1000	1267	1100	
		1034	1294	1022	1281	1119	
21%	5885	1035	1215	1000	1227	1090	1.177
	5886	1092	1270	1070	1270	1132	
	5887	1080	1260	1036	1250	1100	
		1089	1258	1035	1249	1107	
19%	5888	1125	1270	1120	1275	1160	1.120
	5889	1125	1267	1111	1271	1160	
	5890	1110	1265	1100	1270	1150	
		1120	1267	1110	1272	1157	
17%	5891	1087	1205	1087	1222	1137	1.212
	5892	1167	1272	1167	1282	1195	
	5893	1137	1247	1142	1245	1185	
		1130	1261	1132	1250	1172	
15%	5894	1142	1215	1150	1232	1185	1.222
	5895	1195	1255	1195	1267	1207	
	5896	1137	1210	1142	1225	1162	
		1156	1227	1162	1241	1185	
13%	5897	1150	1192	1157	1192	1187	1.237
	5898	1163	1205	1170	1210	1187	
	5899	1180	1215	1187	1225	1197	
		1164	1204	1171	1209	1190	

Here are the long charge runs given these tubes discharging to .50 Volt instead of taking off at 1 V. Though you might get mixed of you only did the 1 Volt

The capacity at .5 V is practically constant for all concentrations except highest & lowest operational Cap is at 15% which has the same number runs as 21% KOH.

No	grow	Hours	Crop V	Aug %	Veg %	Wt %
3553	5	5-Mar 300	960	64		
3554	5	"	992	66.1		
3557	5	"	895	59.6		
3558	5	"	850	56.6		
3559	"	"	1000	66.6		
3560	"	"	1050	70.		
3561	"	"	900	60		
3562	"	"	1000	66.6		
3563	"	"	895	59.6		
3564	"	"	900	60		
3565	"	"	840	56		
3566	"	"	840	56		
3571	"	"	1000	66.6		
3572	"	"	1030	68.2		
3573	"	"	1075	71.6		
3574	"	"	1030	68.6		
3581	"	"	560	37.3		
3582	"	"	560	37.3		
3584	"	"	370	24.6		
3585	"	"	370	24.6		
3589	"	"	1035	69		
3590	"	"	1050	70.		
3607	3.5		952	90	75	68.1
3608	"		955	91	758	68.9
3609	4		1050	87.5	762	66.7
3610	"		1080	90	75.2	67.5

Gut

Cut

Vol	grm		Capacity	Volts	Amps	Watt
3645	4		695		57.9	
3646	4		650		54.1	
3643	4.5		1075		79.6	
3644	"		1085		80.4	
3595	5		1245	73.8	83	61
3596	5		1275	74.1	85	63
3597	5		1217	75.4	81.1	61.1
3598	5		1197	73.8	79.8	58.9
3647	"		815		54.3	
3648	"		975		65	
3659	"		1285	75.8	85.6	64.9
3660	"		1275	75.8	85	64.4
3661	"		1000		66.6	
3662	"		930		62	

following are from 16% NaOH 4 in tubes
5 Hour chg 300

3335			1325	73.6	88.3	65
3336			1332	72.8	88.8	64.6
3351			1225	73.3	81.6	59.8
3352			1230	71.1	82	58.3
3359			1210	72.5	80.6	58.3
3360			1232	72.3	82.1	58.4
3369			1215	72.5	81	58.7
3370			1217	72.6	84.6	61.4
3371			1290	73	86	62.8
3378			1275	73.1	85	62.1

no	gm	Cap	Vefg	Amp-E	Waste
16% NaOH 5 hour chg (continued)					
3389		1250	72	85.3	61.4
3390		1277	71.9	85.1	61.1
3397		1335	72.4	89	64.4
3398		1337	71.7	89.1	63.9
3421		1282	71.8	85.5	61.4
3422		1310	72.2	87.3	63.
3491	4	1100	72.7	91.6	66.6
3492	"	1080	73	90	65.6
3497	"	1050	74.6	87.5	65.3
3498	"	1042	71.9	86.6	62.2
3503	5	1265	72.2	84.3	60.8
3504	"	1250	73	83.3	60.8
3505	"	1005		67	
3506	"	1075		71.6	
3509	4	900		75	
3510	"	900		75	
3511	"	907		75.6	
3512		900		75	

Chg 300 per grain -

		Cap	V.E	AH	WH
3669	4	992	74.6	82.7	61.7
3670	4	950	74.2	79.1	58.7
3671	4	940		78.3	
3672	4	937		78.1	
3673	5	1225	73.3	81.6	59.8
3674	5	1225	73.9	81.6	60.3
3675	5	1285	72.	85.6	61.6
3676	5	1285	72.1	85.6	61.7
3681	4	992	76.1	82.7	62.9
3682	4	952	74.6	81.7	61.1
3683	4	975	76	81.3	61.5
3684	4	975	76.9	81.3	62.5
3697	5	1250	72.9	83.3	60.6
3698	5	1250	73.8	83.3	61.4
3699	4	1037	76.2	86.4	65.9
3700	4	1040	75.9	86.6	65.7
3725	5	1320	75.5	88	66.4
3726	5	1275	75.3	85	64
3727	5	1277	74.6	85.1	63.5
3728	5	1310	76.3	87.3	66.6
3733	4.5	985		73.	
3734	"	970		71.8	
3735	5	1240	74.6	82.6	61.6
3736	5	1185	74.7	79	59.1
3745	5	1237	73.4	82.5	60.6
3746	5	1225	73.9	81.6	60.2

Blanks & Grids in E18 - Temperatures produced by passing 30 40 & 50 amperes through 2 1/2 ROHL.

30 amp rate.

Temp air	Temp cell			Diff
73 -	72.5			= 3
75	84.5	25	amp hours	+ 9.5
75	94	50	"	19
74.5	98	75	"	22.5
73	101.5	100	"	28.5
76.5	105.2	125	"	28.7
78	108	150	"	30
80	111	175	"	31
80.5	112	200	"	31.5
80.5	114	225	"	33.5

40 & 50 about same but after 75 amp 50 rate gives above at 100 to 105

125 " 110

150 114

175 116.5

200 118

225 120

This [illegible] E18 № 15500
24 [illegible] in each [illegible] rate
of 30 [illegible] 450 [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	76	80		75		0

If we charge an E 18. at
30 amp heat at end 22.5 be 12° above atmos.
40 " 17.5 " "
50 " 23.7 " "
Do its very desirable to charge a low rate for heat reasons.

Ent

Hot Ent

Charge temp Reg E 18 no 15500

30 amp charge

Temp air	Cell.		Def
73.5	72.2	0	=1.3
75	77.	25 amp	+2
75	80	50 "	5
74.3	82	75 "	7.7
73	83.5	100 "	10.5
76.5	85	125 "	8.5
78	87	150 "	9
79.5	89	175 "	9.5
80.5	90.5	200 "	10
80.5	92.5	225 "	12

Changing Valling about 3/100 higher each rate.

air	Cell	40 amp	def
71.5	68	0	=3.5
71.5	72.5	25	1
74.5	76.5	50	2
76	80	75	4
73	82	100	9
74	84	125	10
75	86	150	11
77	88	175	11
77	91	200	14
76.	93.5	225	17.5

air	Cell	50 amp	def
70.5	68	0	=2.5
71.5	73.5	25	+2
73	78	50	5
73	82	75	9
73.5	85.5	100	12
74	87.7	125	13.7
74	91	150	17
74	93	175	19
73	95.8	200	22.8
73.5	97.2	225	23.7

12	17.5	23.7	as the 225 amp
10	14.	22.8	200 "
9	11	17	150 "

Same cell discharge 30 amp rate
it was chgd 8 hours at 30 amp.
stood overnight to cool to normal -

Air Temp	Cell Temp		Dif
72.5	71	0	= 1.5
71.5	74.5	25 amp	+ 3
73	78	50	5
73.5	83	75	9.5
75	86.5	100	11.5
76.5	90	125	13.5

End

Above cell only gave 124 to V.
Should have curves dischg at higher rate,

E18 1350 cc. 21% KOH, 61 grms!
2.0 H, saturate the solution -

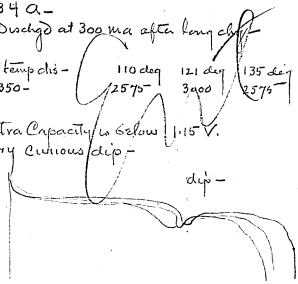
Fe 534 a –

Discharged at 300 ma after being charged –

Normal temp dis –	110 deg	121 deg	135 deg
1350 –	25% –	3400	25%

The extra Capacity is below 1.15 V.
a very curious dip –

dip –



A cell No 597 –

Short chg –

If charged normal & discharg 135° Fahr
gives higher Cap + 3/10 V higher Voltage
than if chgd normally & discharg normal

If charged 135° Fahr + dis chgd normal
the capacity is only 65% of the chgd
normal + the Voltage is less
than 1.18 average against 1.27

Long charge

The Voltages in this case are about
the same –
But the cell chgd hot lost 5%
less Capacity + then chgd is normal & chgd
+ dis hot.
The long charge acts
Entirely dif from short chg
Why

When get North get a
good Record of these long
charges + tales –

Chg 200
Lo 150

Lithium Tubes

		2hrs	3H	4	5	6	7
21% KOH 2 gms LiOH	5992	391	561	691	797	870	937
	5993	391	562	693	798	873	937
	5994	396	575	711	822	917	960
17% KOH 2 gms LiOH	5995	370	540	677	778	862	910
	5996	373	542	683	785	867	908
	5997	372	541	687	786	872	938
13% KOH 2 gms LiOH	5998	358	495	650	746	830	872
	5999	355	485	645	736	825	878
	6000	340	475	622	715	797	857
21% NaOH 2 gms LiOH	6001	393	575	738	841	942	976
	6002	386	563	720	821	920	972
	6003	392	570	735	841	937	980
17% NaOH 2 LiOH	6004	375	555	708	817	910	952
	6005	386	573	742	861	960	1005
	6006	390	574	750	865	970	1015
13% NaOH 2 LiOH	6007	381	567	730	840	935	970
	6008	381	566	731	842	940	982
	6009	382	568	741	857	950	985

Lithia =

Ores sold by E Schaaf-Regelman
17 State St
Battery Park
NY

Spodumen $30.00 ton

SiO_2	63.40
Al_2O_3	28.22
CaO	1.54
Na_2O	2.12
Li_2O	4 @ 6%

Lepidolite $35.00 ton

SiO_2	48.61
Al_2O_3	22.36
CaO	.64
Na_2O	.38
Li_2O	4 @ 6%
K_2O	16.16
MnO	2.05

Amblygonite $45 ton

P_2O_5	46 @ 48%
Al_2O_3	32 @ 34%
Fluorine	4 @ 10
Na_2O	0.4 to 1.5
Li_2O	6 @ 8%

Tested feeding green 1/2 wash not fed and alone in machine without rod moving and without flake feeding
Caught green in dish —
25 Dumps —

1st	25 —	869
2nd	"	873
3rd	"	865
4th	"	880
	4	3487
		872

With the new revolving shafts & arms in the flake Hopper & running it alone got. for 25 dumps

1st	272
2nd	282
3rd	311
4th	298
4	1163
	291

14% variation.

average green 871
" flake 291
1162
75%
5810
8134
8715

75% green 25% f

But no shaking

Will the shaking give more green or flake? —

Another Experiment

Took a tube & bottom cup made 25 dumps of flake alone using plunger to get

9 ozs 295 mlg of flake + 797 grain
whereas without plunger 291 " 872 "

This is a strange result 6 z more when jarred whereas it less - possibly some grain was lost thru holes but probably no flake -

Length of grain 3/8 inch
" flake 7/64th wide

This would show flake took up same room as grain for same weight which is a strange as its 2½ times heavier -

Filled 25 dumps both flake + grain
Weighed 1.050 -
should give 1092 -

Gut

Experiments to determine Concentration of Alkali on chg & discharge of Tubes.

Tube No.				
		KOH, 21%		
6131	Tube fully chgd	quickly	rinsed water	KOH, 0.357
6130	as discharged	"		0.512
				0.155
6136	NaOH, 15%	Charged	"	0.267
6135	"	discharged		0.409
				0.142

Gut

Yellowish sediment on hard rubber in cells is a very basic iron persulphate.

Mr Groth says the iron oxalate as mfd often contains quite a remenant of some basic iron sulphate & while the oxalate is transformed into iron oxide at comparative low temp which would seperate the iron from H_2SO_3 Thinks that there is a residue of SO_4 in final oxide this might explain yellow coating -

		Volts	Amp	watts
5992	21% KOH	72	79.7	57.4
5993	2 LiOH	72.8	79.8	58.1
5994		72.9	82.2	60
5995	17% KOH	72.2	77.8	56.1
5996	2 LiOH	72.2	78.5	56.6
5997		72.2	78.6	56.7
5998	13% KOH	71.1	74.6	53
5999	2 LiOH	71.1	73.6	52.3
6000		71.2	71.5	50.9
6001	21% KOH	69	84.1	58
6002	2 LiOH	68.2	82.1	56
6003		68.6	84.1	57.6
6004	17% KOH	70.5	81.7	57.6
6005	2 LiOH	70	86.1	60.3
6006		70.3	86.5	60.8
6007	13% KOH	71	84	59.6
6008	2 LiOH	71	84.2	59.8
6009		71	85.7	60.8

Reg tubes — Bismuth 210ft group —

Charging Cold 7622 group run hot Capacity
good Volt good — 1280 mah +

Chg hot run cold Capacity low —
500 — but Cap To Volt good

Chg hot run hot, fair Cap good To V

Reg Cold 1280 —

This shows discharg hot is
ok but chg ~~hot~~ is
very bad — for Bismuth
r

Some Bismuth are ~~good~~ fair
when chgd hot discharge hot
1200 off a 1350 tube

Experiments with CP Nickel strips and Regular irons with + without LiOH — KOH, Cl(g) + Reversed —

6457 21% 2 gms LiOH each cell.
6458 " 3 "
6459 " Saturated "
6460 " 1 gm "
6461 33% KOH alone
6462 21 " alone —

24 hours charged — all Ni strips slightly tinted

24 " Reversed

6457 —	0.0069	from
8	0.0078	"
9	0.0135	
6460	0.0092	
6461	0.0200	
6462	0.0080	

2nd charge — 33% has quite a deposit of X all others had deposits but not so much. 1 gm LiOH is next to 33%. 58 + 59 quite small. 21% very only little. as 6459 is equivalent in ions to 33% nearly it seems above LiOH helps diminish X deposit —

2nd Reverse

6457 — Very bright — no gas only O — grease on as H_2O film cleaners
6458 " "
6459 Pretty dark deposit grey shows small crystals
6460 — Very slight brownish deposit not all over cleaners in 2 seconds in HCl
6461 — Black Heavy deposit
6462 " " not so much as 61

Note, Brightness may be due to Hg —

64.59
6461 } Is attacked very slowly by dilute HCl.
6462 Kept at near boiling heat,

as 6462 cleans up in the acid it resembles in appearance exactly No 6459 when 1st taken out, so all the deposits (1st) 59 61 + 62 are the same. It certainly looks as if these deposits were partially amalgamated this would account for the brightness of the strips and in case of 61 + 62 that deposit was not sufficiently supplied with Hg to make them bright — another thing is slow action in HCl which may be explained by Hg. It looks as if KOH, favors amalgam of Ni surfaces in Alkali + thus gives loose deposits of deleterious material + removes old deposits 6459 after ½ hour nearly boiling is now bright test by rubbing slightly with finger its silver like showing that its amalgamated — hence KOH. conduces to amalgamation + holds the mercury in the iron — and also evidently removes some scum that is not removed by KOH alone — otherwise Ni strip wouldnt amalgamate.

after 1 hour in acid No 6461 + 2 still had dull grey deposit — had to polish off with Rag which got black from 61 which has more deposit on it this

grey than 62 although it looked brighter – scarcely a sign of amalgamation see no Hg under Micro –

So far the results would indicate –

1st LiOH. Keeps Hg on the iron + prevents its migration on reverse –
hence iron doesnt go into solution on discharge + permit deposit of oxide inside + one tube, possibly Hg holds Co + other metals back on the iron –

2nd Should cell get reversed very little iron goes over ~~because~~ + considerable Hg which seems to follow the iron –
Any scum or film of X stuff coming on Ni is loosened up by the tendency of the LiOH to form it + cause amalgamation – Without LiOH, considerable iron migrates + scarcely any Mercury – Which is the Reverse with LiOH –

The improvement in old cells is due to film loosening – + should be great on Reverse of the Nickel Electrode –

1 gram per short cask in 21 KOH in not quite
Enough to stop deposit of iron but
probably would be in 15 to 17% KOH,
2 & 3 grams are ok but saturated
8 grams with 21% is too many ions - equals
31% hence if saturated so to be used
then about 10 to 12% KOH is best, 12% giving
Equivalent to 24% ions —

Nickel plating should be thick as with
LiOH it amalgamates. Easy on
any free iron surface it would also
amalgamate & might make short ckt
or local action on tube —

Even Ferrous Na Sulphate irons should
have 12% H_2O if one use LiOH
instead of 5% H_2O — then
iron should be carefully
amalgamated, have high
economy & be held from
migrating in Reservoir —

Cobb

3rd Rev. strip Cathode —

The deposit of iron on strip grows heavier each time — There is unfortunately more deposited on strips in LiOH solns as it rapidly darkens in air — But there is still little, on all, therefore there is not doubt LiOH takes some iron off Ni & permits Hg to amalgamate, I think is no good as yet, probably only two weeks enough LiOH to cause amalgamation & prevent deposit of Iron in Process on charging Reg tube as anode there is some metal, probably that comes over & deposits & this is reduced when it becomes cathode & amalgam takes place —

Think Ni is a safe KOH containing LiOH —

2nd Reverse 40 hours Ni strip Cathode

6457	0078	H_2O_3
58	0037	"
59	0070	"
60	0080	"
now 61	0360	"
62	0105	"

Nickel strip anode about 50 hours

57 pink Red. very light
58 " " spots
59 " " spots
60 " very light
61 "
62 Blood Red. deep like red lacquer —

all these C colors come off unfortunately on clipping in 10% Con. H_2O_2 = Water cup and dilute pinkish — Dry/soft ole [illegible] Nun but [illegible] the test ng

3rd chg — Ni strip Cathode —
57-8-9 — Go bright — Hg pinkish, 61 & 62 dark coming
61 Black — all but 61 & 62 clean up bright after air oxidation
clean mechanically — 61 & 62 dirt clean in 5 minutes —
all the iron spots pimples — when Ni strips 1st taken out H_2O — [illegible] off — greasy — purple in Ether Alc or organic Rubber compounds —

Appearances of a lot of Cells -

72

100 mlgr Flow Sulph

5775 - Tube grey Tube Yellow brown (light) no crystals

5776 - " Lighter Cells - two crystals

~~[illegible]~~ tint of yellow on small part in inf Bar -

5777 Tube same as 5775

Tube grid yellow - Crystals on metal parts.

250 mlgr of Sulphur

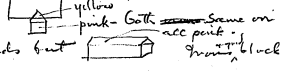
5778 - Crystals shiny - all over all parts Tube is grey in bottom part + disappears with 1/16" of top where it is yellow - Ms rings look just as if now turn elapsed on rubber - The top 1/2" of tube is yellow - light shade - Rubber yellow on cut surfaces from grid grey

5779 - Crystals all over - tubes dark brownish yellow all over - Tube grid black - from grid block

5780 - Crystals all over No yellow on Rubber Tube bright just detect shade off color of pure Mg - probably due to yellow grid clean [from grey grid and grey grid tube]

5781 ~~Do~~ Everything coated
Crystals - tube darkish - tube grid darkish
but tint light - Rubber very yellow
all over - from black grid black

5782 Crystals all over -
tube bright but tinted up to 1/2" of
top where the gradually brights.
Tube grid tinted yellow to orange
Worn tube -
Bottom Rubber is coated pinkish
Color - middle side rubbers -
yellows in Cut Edges.



5783 = Crystals all over
tube really bright - grid darkish
tint - rings bright -
Rubber ~~on~~ each Except bottom
for 1/16 up all around hooks are
if placed with Copper
but rub off - from Black -

Geo Mulg J. Lapham

5784 Tube deep brown – grid ditto –
Red sediment on rubber – slight yellow
Brown grid & pkt. grey Nuts amalgamated.

5785 Tube brownish yellow not so deep
as 5784 – but grid is jet black –
Graphite & grid grey – nuts & everything
amalgamated in minutes – yellow on
Cut surface of Rubber – Red sediment
on one rubber – tube rings same tint
as tube –

5786 Tube and rings – deeper tint than
5785 – & grid yellowish & deeper than
tube – nuts & grid grey – parts amalgamated
Red deposit. No yellow on Rubber
Deposited Fe on the grid dust rub off –

5787 Tube & rings yellow
Tube grid deeper yellow —
Rubber yellow on cut black on top
Fat grid uniformly gray

5788 Everything same as 87 except
rubber all black — no trace yellow

5789 Tube rings much deeper yellow than —
88. Tube grid very deep yellow.
marked dif but the same shade —
Rubber black no sign yellow
Iron bright + apparently annealed

5790 ~~Both~~ crystals on all parts —
~~Tube~~ bright grid yellow brown ~~tint~~
Iron grid + plat black. Rubber black.

5791 - Same as 90 - but bottom rubber
has the copper like deposit —
No yellow on cut surface or brief exposure
deposit on ~~[illegible]~~ fat grid & plat black —

5792 Dense Coating Crystals on tube, - dark brown tube and black except 1/2 inch of bottom where it is light violet tint. Rubber yellow on Cut surfaces

5793 Tubes light yellow and about same - Rubber coated grey color. Possibly Hg globules - Micro shows they are Hg coating & thick & carefully covered by conducting Fe grey amalgamated

5794 Tubes very bright no tint look like new - Fe grey amalgamated Rubber perfectly coated with Hg globules Many cracks & carefully welded short cut. Yellow on Cut Edges of Rubber.

5795 – Tube pearly deep yellow
Rump ditto – grid deeper tint –
Tz pkt grey – ~~[illegible]~~ amalgamated –
Hg globules in my cracks &c –
yellow on Cut of Rubber –

5796 Tube etc like 95 – Iron pkt
rough apparently no amalgamation
of the grid – its darkish – pkt grey
Hg globules Coat rubber – no yellow
on Rubber –

5797 Tube & rump lighter than
96 – grid yellow tint very light
Tz pkt grey grid deeper color
Rubber Hg Globules No yellow
on Rub Cut.

5798 about same as 97 some yellow on Rub out.

5799 Crystals all over - rather deep yellow on tube & rings - grid much deeper yellow - Front grid grey bottom same grey Nothing - no yellow.

5800 - Tube perfectly bright, grid slight tint - Fresnel top - for grid darkish - no remedy No rubber on

5801 Tube very slight yellow tint, only 1/2" at top same with grid - 97 dark no remedy - No rubber

5775 to 5801 —
put in Water - all
Crystals disappear

Equivalent Ions

9% LiOH. 15% NaOH. 21% KOH

36.4 RbOH. 56.25 CsOH.

Weight of new tube plate complete.

483 grms 1 lb 1 oz

It is however extra heavy standard

With 3½ lb coat new 8 tube condenser anti bounce compound —

No 1	10.932
2	
3	10.476
4	10.861
5	10.937
6	10.554
7	10.808
8	11.006
averages	10.694

Original Extension
Extension taken in cold
652 m.c.g
94.5% or 5½%

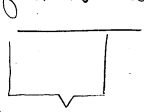
Time to free 16½ mm at 47 Rev per min

One Cubic inch of Cast Ni. of Coke
which has been oxidized & red by H.
& Reg. .0001 - weighs 1 oz
3.157 —

with the 6" Reduction Tube weight
of Section 6 dia 1" long 75 grm
or 6" to lb - with 42 inch hot
gases for 1 hour reducing time 7 lbs
or 70 lbs daily - per tube - 10 hours -

Results using 1/2 check U.S. 00005
oxdzd transparent yellow - Reduced by
Hydrogen 4 mil of flake 24 x 10 z
9/08 Big Drum glass —

4 mil is enough flake + covers cobalt
surface — conforms to irregularities of
Edges turn up against tube or of
Chunk - the green showing under 3 1/2
lb not in cause of turn up —
It would be safe to use less than
4 mil to 24 green although there
are lots of 2 or 3 thickness of
flake.



Sections show hole through ie show
green in center spot no flake —
sometimes sections break out thus

Core of tubes all broke up - apparently soft in the center & hard at Edge
This pkg is quite different from all others

Flake & grain both scattered by falling on wires — Seems as if more ~~[illegible]~~ flake went to edge & made better contact with tube —

Regeneration of old Cells -

	5th Inoculation	6th Inoculation		
2491 A	727	730		
92 A	620	763		
93 A	730	730		
		Bottle gone		
5359	713	710		
60	647	650		
61	700	700		

R.A. Experiments Absorption of Iron Mix of Cracker —

3 grms dissolved 100 Cent. lost 3/10ths of 1%

Same sample allowed to stand in air saturated with moisture absorbed as follows —

15 mins	absorbed	6 milligrammes
30 "	"	8 "
45 "		9 "
75 "		11
105 "		14
135 "		14
225 "		14
315 "		17

Total absorbed in 5 hours 15 mins 17 mlg 56%

EWA

	Dust	1st A	2	3	
5653 A	850	817	820		No improvement
5837 A	723	927	1013	1033	1030 – on hot lect
Kept soaked out then H_2O little KOH few drops then put in 100 mily KOH cooked all night, poured off & washed out in H_2O alkaline – then in 2% K all night – [illegible]					
5365 A	653	703	727	727	
Boiled out in very weak KOH 3 [illegible] hot [illegible]					
2491 A	790	653	600	600	
2492 A	793	713	620	613	
2493 A.	777	700	607	600	
5359	577	727	680	673	
5360	525	683	643	653	
5361	560	667	657	663	
Been hot making					
2433 A	927	990	1017	1010	
5819 A	378	373	337		
5820 A	333	327	297		
5864 A	623	933	947		
5913 A	873	900	887		

	footings	
2491B	.790	610
92B	.793	660
93B	.777	627
5359 B	547	750
60 B	525	760
61 B	560	760
5653B	850	600
5365B	653	600
7527 B	493	587

Notice that green that has Bismuth in that LiOH cells on 1st 5 runs Cold are higher than plain 21% K

Cells with $SrCl_2$ $BiCl_2$ + or radical are with LiOH much lower than plain 21% K on 1st 5 calorimeters

Iron is not affected by Changing Heat, like the Nickel –

Plain Ni in 21% alone dont give 1/3 of its Capacity on Chg hot 130 fold – with 21 K + 2 Lioff, it gives about 1/2 Cap + with 21 K 2 Lioff + Bismuth in green, gives about 3/4 or sometimes full Capacity